containing no element of Group XIII, in which the lowest energy level of unoccupied molecular orbital having the valence p-type atomic orbital of the atom of the Group II to the Group XII or Lanthanide series as a main component wherein the coefficient represented by a linear combination is 0.4 or more is calculated to be 0.008 atomic unit (Hartree) or less by the calculation of density functional method (B3LYP/3-21G level) and wherein the compound (A) is a porphyrin or phthalocyanine complex in which a metal atom of the Group II to the Group XII or Lanthanide series is coordinated, with

(B) a metal compound selected from the group consisting of compounds represented by the general formula [4]:

$$L_a M^1 X_b \qquad [4]$$

wherein M^1 is a metal atom of the Group III to the Group XIII or Lanthanide series; L is a group having cyclopentadienyl type anion skeleton or a group containing a hetero atom, a plurality of L's may be linked directly, or through a residual group containing a carbon atom, a silicon atom, a nitrogen atom, an oxygen atom, a sulfur atom or a phosphorous atom; X is a halogen atom or a hydrocarbon group; "a" represents a number satisfying $0<a\leqq 8$; and "b" represents a number satisfying $0<b\leqq 8$, and μ-oxo type compounds thereof.

9. (Twice Amended) A catalyst for addition polymerization obtained by contacting:

(A) a compound containing an atom of the Group II to the Group XII or Lanthanide series of the Periodic Table of the Elements and containing no element of the Group XIII, in which the lowest energy level of unoccupied molecular orbital having the valence p-type atomic orbital of the atom of the Group II to the Group XII or Lanthanide series as a main component wherein the coefficient represented by a linear combination is 0.4 or more is calculated to be 0.008 atomic unit (Hartree) or less by the calculation of density functional method (B3LYP/3-21G level) and wherein the compound (A) is a porphyrin or phthalocyanine complex in which a metal atom of the Group II to the Group XII or Lanthanide series is coordinated, with

(B) a metal compound selected from the group consisting of compounds represented by the general formula [4]:

$$L_a M^1 X_b \qquad [4]$$

wherein M^1 is a metal atom of the Group III to the Group XIII or Lanthanide series; L is a group having cyclopentadienyl type anion skeleton or a group containing a hetero atom, a plurality of L's may be linked directly, or through a residual group containing a carbon atom, a silicon atom, a nitrogen atom, an oxygen atom, a sulfur atom or a phosphorous atom; X is a halogen atom or a

hydrocarbon group; "a" represents a number satisfying $0<a\leqq 8$; and "b" represents a number satisfying $0<b\leqq 8$, and μ-oxo type compounds thereof, and an organoaluminum compound (C).